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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,098	12/21/2005	Takashi Ito	9369-114US (T37-196236C)	8148
570 7590 03/25/2010 PANITCH SCHWARZE BELISARIO & NADEL, LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103				
EXAMINER				
EOFF, ANCA				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
03/25/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@panitchlaw.com

Office Action Summary

Application No.

10/562,098

Applicant(s)

ITO ET AL.

Examiner

ANCA EOOF

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 7-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Interval Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1 and 7-10 are pending in the application. Claims 2-6 have been cancelled.
2. The foreign priority document JP 2003-180470, filed on June 25, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 9-10 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) and in further view of Chiu et al. (US Pg-Pub 2005/0148679).

With regard to claims 1 and 10, Ohkuma et al. disclose a photosensitive composition containing a radical-polymerizable monomer, a cationic-polymerizable monomer, a radical polymerization initiator and a cationic-polymerization initiator (abstract).

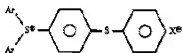
The radical-polymerizable monomer may be a monomer with (meth)acrylate groups (column 3, lines 17-48).

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The cationic-polymerizable monomer may be a monomer with epoxy groups (see examples in columns 5-6).

The radical-polymerization initiator may be a compound exhibiting effective light absorbtion in UV region (column 8, lines 58-60).

The cationic-polymerization initiator may be represented by the formula (I):



(I) (column 10, lines 1-10), wherein Ar is an aryl group and X⁻ may be SbF₆⁻ (column 10, lines 23-24).

The specific examples in the specification show cationic-polymerization initiators wherein Ar is a phenyl group (see Examples 1-3 and 5-8 in columns 12-15).

The compound (I) having as Ar a phenyl group and as X⁻ a SbF₆⁻ anion is equivalent to the compound of formula (I) of the instant application.

While Okhuma et al. do not specifically teach the compound of formula (I) of the instant application, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain it, based on the teachings of Okhuma et al. regarding the compound (I) above, the examples of anions X⁻ and the examples wherein Ar is a phenyl group.

However, Ohkuma et al. do not teach the purity of the cationic-polymerization initiator of formula (I), as required by the instant application.

Date et al. disclose a method of manufacturing sulfonium salts used as photocationic polymerization initiators for resists (par.0045).

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In Example 5, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% (par.0063-0065). It is not explicitly specified that (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is synthesized in Example 5 but the ingredients are the same as for Example 2 which leads to (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate except that potassium hexafluoroantimonate replaces potassium hexafluorophosphate. Date et al. further disclose that ¹³C-NMR analysis and IR analysis indicated that the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate comprises small amount of raw materials diphenyl sulfoxide, diphenyl sulfide(par.0052-0053 and par.0063-0064).

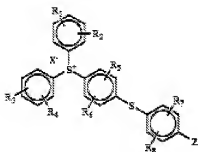
It is the examiner's position that there is no compound represented by formula (II) of the instant application in the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate of Example 5 of Date et al. Therefore the limitations of claims 1 and 10 for the quantity of compound of formula (II) are met.

It would have been obvious for one of ordinary skill in the art to use the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% obtained in the process of Date et al. as photocationic polymerization initiators in the composition of Ohkuma et al., since Date et al. specifically indicate this use for the high-purity sulfonium salts (Date et al., par.0045 and par.0062).

Ohkuma and Date do not teach that the compound of formula (I) is the only compound dissolved or dispersed in a solvent.

Chiu et al. teach aryl salts of formula (II):

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(II) (formula (I) in par.0010) , wherein Z may be a hydrogen atom and X^- may be SbF_6^- (par.0011 and par.0019).

The compound of formula (II) above, wherein Z is a hydrogen atom and X^- is SbF_6^- is equivalent to the compound (I) of Ohkuma et al. and the (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate of Date et al.

Chiu et al. further teach that the salt of formula (II) may be dissolved in a solvent, such as propylene carbonate (par.0020 and par. 0035).

Chiu et al. further teach that the sulfonium salts may be used in radiation polymerizable compositions, in combination with cationically polymerizable monomers (par.0022-0023). Additionally, Chiu et al. show that the sulfonium salt is dissolved in a solution and then it is mixed with the other components of the composition (par.0035). The sulfonium salt is the only component of the composition in form of a solution (see par.0035).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Chiu et al. for the composition of Ohkuma modified by Date and prepare a composition wherein only the sulfonium salt is dissolved in a solvent, with a reasonable expectation of success.

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With regard to claim 9, Date et al. disclose the synthesis of (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate in Example 5 (par.0063-0065). The purity of the compound is more than 99% so raw materials are comprised in an amount of less than 1% (par.0064 shows that raw materials are the impurities found in the compound).

The raw materials for the synthesis of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate comprise about 30% diphenylsulfoxide (Examples 2 and 5 in par.0052-0053 and par.0063). Therefore, it would be expected that the mixture of raw materials left as residues in the of 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate would comprise 30% diphenylsulfoxide.

The 4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate obtained in Example 5 would comprise less than 0.3% of diphenylsulfoxide, which encompasses the range claimed in claim 9 of the instant application.

5. Claims 7-8 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) and Chiu et al. (US Pg-Pub 2005/0148679) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

With regard to claims 7-8, Ohkuma modified by Date and Chiu teach the composition of claim 1 (see paragraph 4 of the Office Action) but Ohkuma, Date

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and Chiu fail to disclose that the composition further comprises an oxetane compound and a polyalkylene ether compound.

Steinmann discloses a radiation-curable composition comprising:

- (A) at least one cationically polymerizing organic substance;
- (B) at least one free-radical polymerizing organic substance;
- (C) at least one cationic polymerization initiator;
- (D) at least one free-radical polymerization initiator (par.0023-0027).
- (E) at least one hydroxyl-functional compound (par.0028)
- (F) at least one hydroxyl-functional oxetane compound (par.0029).

The preferred compound (F) is 3-ethyl-3-hydroxymethyl-oxetane (par.0110)

In Example 1 (table 2, par.0151), Steinmann specifically discloses that 3-ethyl-3-hydroxymethyl-oxetane (Cyracure UVR 6000, in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 26.78 wt.% with respect to the 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

Steinmann discloses that the one hydroxyl-functional compound (E) (par.0023-par.0028) may be polypropylene glycols of various molecular weights (par.0094), glycerine propoxylated polyether triol and polyethyleneglycols (par.0103). These compounds are equivalent to the polyalkylene ether compounds of the instant application.

In Example 1 (table 2, par.0151), Steinmann specifically discloses that glycerine propoxylated polyether triol (Voranol CP 450 in table 1, par.0143) is

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comprised in the radiation-curable composition at a ratio of 17.85 wt.% with respect to 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

The composition of Steinmann et al. gives exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (par.0002).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a at least one hydroxyl-functional compound, such as polypropylene glycols of various molecular weights, glycerine propoxylated polyether triol and polyethyleneglycols and at least one hydroxyl-functional oxetane compound , as disclosed by Steinmann, to the composition of Ohkuma modified by Date and Chiu , in order to obtain a composition with exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (Steinmann, par.0002).

Response to Arguments

6. Applicant's arguments with respect to claims 1 and 7-10 have been considered but are moot in view of the new grounds of rejection.

Conclusion

7. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.**

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See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

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Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1752